the time to the constant temperature. HRA is described in further detail in U.S. Pat. No. 7,718,019.

The trial was conducted on ½" production at 180 feet per minute. The introduction of WGA outside the mixer trial was conducted for 1¾ hours, trials of shorter or longer duration are also possible. The introduction of WGA inside the mixer was conducted for approximately 10 minutes before a small lump caused a paper break, which forced shutdown of the boardline. The lump may have been the result of changing from the outside of the mixer configuration to inside the mixer configuration, a change that caused the port from the densified layer discharge apparatus to become plugged.

Stiffening rates were approximately 21 seconds for the back densified layer and 30 seconds for the main slurry. Hardness tests using a USG durometer tester just before the knife measured **67** to **70**. When a board knife sample was checked off line, the hardness across the board was very uniform. The boards made during the trial did not show any paper-densified layer bond problem. Nail pull values were typical of board made with HRA.

On-line hydration Temperature Rise measuring System (TRS) during WGA trial was as follows: At 15:17, time to 50% hydration was 4.1 minutes on densified layer, 52.8% hydration at knife. At 15:27, time to 50% hydration was 3.6 minutes on main slurry, 58.6% hydration at knife. At 15:38, time to 50% hydration was 3.9 minutes on densified layer, 54.1% hydration at knife. At 15:51, time to 50% hydration was 3.8 minutes on main slurry. 57.4% hydration at knife.

EXAMPLE 2

Another trial is run, similar, to that described in Example 1, except that a single WGA source **15** is used to supply both discharge apparatuses **630**, **730**, and no WGA is supplied to the mixer **24**. For this trial a system **712**, as shown in FIG. **9**, is employed, which is a variation on the system **612**. The system **712** includes a single source **15** and lacks a WGA transfer line to the mixer. The system **712** is advantageous as only a single source need be used.

EXAMPLE 3

Still another trial is performed, similar, to that described in Example 2, but utilizing a further refined system **812**. Unlike systems **612** and **712**, the system **812** as shown in FIG. **10** includes a single injection ring **945** on the main discharge apparatus **630**. The injection ring **945** is operatively associated with at least one tee **63** set-up in a manner analogous to that for injection ring **45** shown in FIG. **3**. The densified layer discharge apparatus eliminates the ring **845**, and injects both foam and WGA at the gate **1045** using a tee **63** set-up in a manner analogous to that for injection ring **45** shown in FIG. **3**.

All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

The use of the terms "a" and "an" and "the" and similar referents in the context of describing the invention, especially in the context of the following claims, are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms, that is, meaning "including, but not limited to," unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language, for example, "such as", provided herein, is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

The invention claimed is:

1. A method of introducing a production additive comprising a starch solution to a post-mixer aqueous dispersion of calcined gypsum, the method comprising:

forming an aqueous dispersion of calcined gypsum in a mixer chamber;

discharging the aqueous dispersion into a discharge apparatus;

introducing a production additive comprising a starch solution into the aqueous dispersion within the discharge apparatus, wherein the production additive has a viscosity of about 2000 centipoises to about 4000 centipoises, wherein the aqueous dispersion of calcined gypsum has a viscosity, and wherein a ratio of the viscosity of the production additive to the viscosity of the aqueous dispersion is between about 10:1 to about 2:1.

2. The method of claim **1**, wherein the ratio of the viscosity of the production additive to the aqueous dispersion is between about 4:1 to about 2:1.

3. The method of claim **1**, wherein the production additive further comprises an accelerator.

4. The method of claim **3**, wherein the accelerator comprises a wet gypsum accelerator (WGA).

5. The method of claim **1**, wherein the production additive further comprises foam.

6. A method of introducing a production additive comprising a starch solution to a post-mixer aqueous dispersion of calcined gypsum, the method comprising:

forming an aqueous dispersion of calcined gypsum in a mixer chamber;

discharging the aqueous dispersion into a discharge apparatus;

introducing a production additive comprising a starch solution into the aqueous dispersion within the discharge apparatus, wherein the production additive has a viscosity of about 2500 centipoises to about 5500 centipoises, wherein the aqueous dispersion of calcined gypsum has a viscosity, and wherein a ratio of the viscosity of the